



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/774,495	02/10/2004	Sandor L. Barna	M4065.0864/P864-A	8911
24998 7590 01/24/2008 DICKSTEIN SHAPIRO LLP 1825 EYE STREET NW Washington, DC 20006-5403			EXAMINER TRAN, NHAN T	
			ART UNIT 2622	PAPER NUMBER
			MAIL DATE 01/24/2008	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/774,495	Applicant(s) BARNA ET AL.	
	Examiner Nhan T. Tran	Art Unit 2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 October 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-4, 8-10, 12, 13, 15, 17-20 and 24-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 12, 15, 17-20 and 25-30 is/are allowed.
- 6) ☒ Claim(s) 2-4, 8-10, 13 and 24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 10/26/2007 with respect to independent claims 15, 19 and 27 have been fully considered and are persuasive.
2. Applicant's arguments filed 10/26/2007 with respect to independent claim 13 have been fully considered but they are not persuasive.

The Applicant argues that Elabd and Zhou do not teach or suggest $n=3$ for binning pixel signals (see remarks, page 12).

In response, the Examiner respectfully disagrees with the Applicant. As disclosed in col. 9, lines 14-16 of Zhou, the binning process can be performed in **rectangular** kernels of m by n pixels ($m \neq n$) other than the square kernels of 1×1 , 2×2 and 4×4 . From this suggestion, the rectangular binning can be achieved in 1×3 in which $n=3$. Thus, Zhou clearly suggests $n=3$ for binning pixel signals. Therefore, the rejection of claim 13 is maintained.

3. Additionally, upon further consideration, the allowable subject matter of claims 9 & 24 previously indicated by the Examiner has been withdrawn due to 35 U.S.C 112 rejection as set forth below. The Examiner regrets for any inconvenience caused by this withdrawal.

Specification

4. Amendment to the specification filed 10/26/2007 to include the parent U.S. Patent No. 6,765,613 is acknowledged and accepted.

Claim Objections

5. Claims 9, 13, 15, 19 and 24 are objected to because of the following informalities:

Regarding claim 9,

In lines 6-7 of this claim, "output a combination of second and third amplified image signals at a subsequent time;" should be corrected to read as -- output a combination of **said** second and third amplified image signals at a subsequent time; --.

Regarding claim 13,

In line 6 of this claim, "said another plurality of amplified pixel signals" should be corrected to read as -- said another plurality **n** of amplified pixel signals --.

Regarding claim 15,

In lines 6-7 of this claim, "said another plurality of amplified pixel signals includes n-1 of the same amplified pixel signals as obtained in said first providing;" should be corrected to read as -- said another plurality **n** of amplified pixel signals **includes** **include** n-1 of the same amplified pixel signals as obtained in said first providing; --.

Regarding claim 19,

In lines 5-6 of this claim, "wherein said plurality n of adjacent row pixel values and said another plurality of adjacent row pixel values have at least one common row element;" should be corrected to read as -- wherein said plurality n of adjacent row pixel

values and said another plurality of adjacent row pixel values have at least **one** **common pixel value corresponding to** one common row element; --. *It is noted that since the pixel values cannot be equal to a row element, the suggested correction is to better clarify the claim language.*

Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 24 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 24 recites the limitation "said third image part" and "said second image part" in lines 2 & 4. There is insufficient antecedent basis for these limitations in the claim.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

9. Claims 2-4, 8-10 & 24 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for storing pixel signal and reset signal into first capacitor (C6) and second capacitor (C5) in the description corresponding to **Fig. 2B**

(one embodiment), *or* being enabling for storing pixel signals into first to fourth capacitors (C5 to C8) in the description corresponding to **Fig. 4** (another embodiment) **without storing reset signals** (see specification in US 6,765,613, col. 3, lines 40-44 in which **the reset signals are never stored** in the capacitors C5 to C8 in the embodiment of Fig. 4) does not reasonably provide enablement for independent **claim 9** for “**said noise reduction circuit includes a first fixed pattern noise reduction circuit, having first and second capacitor elements respectively storing signal and reset amplified pixel values for said first amplified image signal, a second fixed pattern noise reduction circuit having third and fourth capacitors respectively storing signal and reset amplified pixel values for said second amplified image signal, and outputting combined signal and reset values for said first and second amplified image signals at said first time.”**

The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims. Thus, claims 2-4, 8-10 & 24 cannot be enabled by one skilled in the art.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Elabd (US 5,272,535) in view of Zhou et al. (US 5,909,026).

Regarding claim 13, Elabd discloses a method of binning pixels, comprising:

first providing a plurality n of pixel signals at a first time (a plurality of pixels from row 0 and row 1 are provided at a first time as shown in Fig. 4D for pseudo interlaced method; see col. 7, lines 15-29);

adding said n pixel signals (row 0 and row 1 are added) together to provide a first n -binned signal (Fig. 4D; col. 7, lines 15-29);

second providing another plurality n of pixel signals (a plurality of pixels from row 1 and row 2) at a second time, wherein said another plurality of pixel signals includes $n-1$ of the same pixel signals (same row 1) as obtained in said first providing (Fig. 4D and col. 7, lines 15-29);

and adding said another plurality n of pixel signals (row 1 and row 2) to provide a second n -binned signal different from the first n -binned signal (Fig. 4D and col. 7, lines 15-29);

Elabd does not explicitly disclose that the plurality of pixel signals are amplified prior to the binning (combining) process, and $n = 3$.

However, Zhou teaches an image sensor comprising active pixels (APS), each includes a source follower amplifier (215 shown in Fig. 2A and col. 4, line 59) for amplifying each pixel signal prior to outputting the pixel signal to an image processing

unit for binning by adding pixel signals together using square or rectangular kernels of $m \times n$ pixels (col. 6, lines 37-40; col. 7, lines 49-67 and col. 9, lines 14-16). Such the implementation of active pixel sensor having a built-in amplifier and adding pixel signals together in the rectangular kernels would increase signal-to-noise ratio as taught by Zhou in col. 6, line 67 – col. 7, line 3.

Therefore, it would have been obvious to one of ordinary skill in the art to modify the image sensor in Elabd to include the built-in amplifier for each pixel and adding a plurality of n pixel signals, wherein $n = 3$, in view of teaching of Zhou so as to increase signal-to-noise ratio.

Allowable Subject Matter

12. Claims 12, 15, 17-20, 25, 27-30 are allowed.

(Please note that the Examiner's objection set in section 5 above must be complied in condition of allowance of these claims).

13. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 15, the prior art of record fails to teach or fairly suggest the combination of all limitations of claim 15 that includes **“using at least two separate noise reduction circuits, a first of which reduces noise in a first amplified pixel signal, a second of which reduces noise in a second amplified pixel signal, and said first and second amplified pixel signals being used to form said first n -binned signal, said second amplified pixel signal being retained for use with a**

third amplified pixel signal later processed by said first noise reduction circuit to form said second n-binned signal.”

Regarding claim 19, the prior art of record fails to teach or fairly suggest the combination of all limitations of claim 19 that includes **“wherein said offset reduction circuit is operable to store first pixel values of said plurality n of adjacent row pixel values not corresponding to said at least one common element on first capacitor elements for use at the first time, to subsequently store second pixel values of said another plurality of said adjacent row pixel values not corresponding to said at least one common element on said first capacitor elements for use at the second time, and to store third pixel values corresponding to said at least one common row element on second capacitor elements for use at the first time and the second time.”**

Regarding claim 27, the prior art of record fails to teach or fairly suggest the combination of all limitations of claim 27 that includes **“a plurality of capacitor elements, including first, second, third, and fourth capacitor elements, wherein said first and second capacitor elements store respective said first and second pixel signals for said first combined pixel signal, wherein said third and fourth capacitor elements store respective said second and third pixel signals for said second combined pixel signal, and wherein said first and second capacitor elements store respective said third and fourth pixel signals for said third combined pixel signal.”**

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nhan T. Tran whose telephone number is (571) 272-7371. The examiner can normally be reached on Monday - Friday, 8:00am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Ometz can be reached on (571) 272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



NHAN T. TRAN
Patent Examiner